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(57) Abstract: A personal digital assistant (PDA), wireless telephone, portable computer or other user device obtains and stores a vendor identifier associated with a particular physical vendor location designated as being of interest by a user of the device. For example, the vendor identifier may be obtained by the user device via a wireless communication link established with a system at the physical vendor location, in response to entry of a bookmark command by the user. The stored vendor identifier serves as a bookmark for the corresponding vendor location, and is subsequently utilized by the user device to retrieve or otherwise obtain updated vendor information periodically for the particular vendor location, such that the latest information regarding the bookmarked vendor location is made available to the user via the user device.

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Methods and apparatus for electronic bookmarking of vendor locations via a personal digital assistant or other user device

Field of the Invention

The present invention relates generally to wireless communication using a personal digital assistant (PDA), wireless telephone, portable computer or other type of user device, and more particularly to wireless communication techniques which allow users to access information at physical vendor locations via such devices.

5

Background of the Invention

Portable user devices such as personal digital assistants (PDAs), wireless telephones, portable computers, etc. are often configured to provide wireless access to information available over the Internet. Such devices are also generally configured to communicate with the Internet over conventional wired connections. Local wireless communication can be provided for these user devices via portable telephone frequencies, e.g., frequencies on the order of 900 MHz. It is expected that so-called third generation (3G) systems currently under development will provide significantly increased bandwidth, e.g., an amount of bandwidth suitable for supporting real time video streaming and other high bit rate services. Furthermore, recent development of wireless communication standards such as wireless access protocol (WAP) and Bluetooth have further enhanced the communication capabilities of the above-noted user devices.

Despite these advances, conventional user devices remain deficient in a number of important areas. One such area is the retrieval and processing of data associated with physical vendor locations, such as stores, restaurants, movie theaters, amusement parks, etc. The conventional devices generally fail to provide adequate techniques for electronically retrieving and processing information associated with these and other physical vendor locations, and more particularly, those physical vendor locations frequented by and of greatest interest to the user. For example, the conventional user devices fail to provide a satisfactory bookmarking mechanism for physical vendor locations, i.e., a mechanism whereby a user can indicate interest in a particular vendor location via a user device and have up-to-date and accurate information regarding the vendor location delivered in an efficient manner to the user device.

A number of bookmarking mechanisms are known in other contexts. For example, it is common for a user of a browser to bookmark a uniform resource locator (URL) of a web site of interest, such that the user does not have to repeatedly enter the URL each time the site is accessed.

5 Another context in which bookmarking mechanisms have been developed is broadcast television programming. By way of example, a conventional technique designed to facilitate user access to broadcast programming content via an electronic programming guide (EPG) is described in PCT International Application No. WO 99/38321 published July 29, 1999 and entitled "Home Entertainment System and Method of Its Operation." In this
10 technique, a current television program displayed on a television screen of a home entertainment system includes an announcement or advertisement of a future television program. A user can then invoke a command to activate an EPG function, and information regarding the future program is retrieved from an EPG database file associated with the current program. Via the EPG function, the user can direct the system to record the future
15 program, to turn on the television automatically at the appropriate broadcast time for the future program, or to perform other functions.

Information regarding physical vendor locations can also be stored by name in an in-car navigation system, e.g., by a user entering identifying text and the current global positioning system (GPS) coordinates for latitude and longitude. However, such systems
20 generally require a clear view to the sky in order to receive satellite-based signals, and generally will not work within a building or other structure.

The above-noted conventional bookmarking mechanisms developed for the browser, broadcast programming and navigation contexts are generally not applicable to bookmarking of physical vendor locations via a PDA or other type of user device. A need
25 therefore exists for suitable techniques for electronic bookmarking of physical vendor locations via a PDA or other user device.

Summary of the Invention

The invention provides techniques for electronic bookmarking of physical
30 vendor locations, such as stores, restaurants, theaters, etc.

In accordance with one aspect of the invention, a personal digital assistant (PDA), wireless telephone, portable computer or other user device obtains and stores a vendor identifier associated with a particular physical vendor location designated as being of interest by a user of the device. For example, the vendor identifier may be obtained by the

user device via a wireless communication link established with a system at the physical vendor location, in response to entry of a bookmark command by the user. The stored vendor identifier serves as a bookmark for the corresponding vendor location, and is subsequently utilized by the user device to retrieve or otherwise obtain updated vendor information 5 periodically for the particular vendor location, such that the latest information regarding the bookmarked vendor location is made available to the user via the user device.

In accordance with another aspect of the invention, the updated vendor information may be entered in an appropriate storage location by the vendor via a connection established with a network such as the Internet. For example, the vendor may access a web 10 site which allows the vendor to enter the appropriate updates. The web site may be implemented by a service provider who charges the vendor for use of the vendor identifier and for entry of the updates. The updated vendor information may then be retrieved by the user device via a connection established with the same network. For example, the user device may access the web site using the vendor identifier in order to obtain the desired updated 15 vendor information.

In accordance with yet another aspect of the invention, the user device may provide its address or other identifying information to a vendor location system, such that the vendor is thereby given permission to "push" updated vendor information to the device automatically.

20 In accordance with a further aspect of the invention, the user device may utilize the stored vendor identifier in a filtering operation to filter from a set of available vendor information the particular updated vendor information for the vendor location designated as of interest by the user.

Advantageously, the electronic bookmarking techniques of the present 25 invention allow a PDA or other user device to store vendor information and periodically update that information in a particularly efficient manner. The techniques ensure that information provided via standards such as wireless access protocol (WAP) and Bluetooth is of optimal utility to both vendors and users. These and other features and advantages of the present invention will become more apparent from the accompanying drawings and the 30 following detailed description.

Brief Description of the Drawings

FIG. 1 is a block diagram showing an example of an information processing system in accordance with an illustrative embodiment of the invention.

FIG. 2 is a flow diagram of an electronic bookmarking process that may be implemented in the system of FIG. 1 in accordance with the illustrative embodiment of the invention.

5 Detailed Description of the Invention

FIG. 1 shows an information processing system 100 in accordance with an illustrative embodiment of the invention. The system 100 comprises a vendor location system 102 and a user device 104. The vendor location system 102 in this embodiment includes a wireless transceiver 110, a central processing unit (CPU) 112, a memory 114, and 10 a network interface 116, which are configured in this embodiment to communicate over a set 117 of one or more system buses or other type of interconnections. The wireless transceiver 110 transmits and received information via an antenna 118. The user device 104 includes a display 120, an antenna 122, and a set of keys 124. The user device 104 further includes a wireless transceiver 126, a CPU 128 and a memory 129 as shown.

15 The user device 104 communicates with the vendor location system 102 via one or more communication channels established between antenna 118 and antenna 122 as indicated at 125. The network interface 116 of the vendor location system 102 communicates with a network 130 which may represent the Internet, a wide area network (WAN), a metropolitan area network (MAN), or a local area network (LAN), as well as 20 portions or combinations of these and other networks. Coupled to the network 130 are servers 130-1, 130-2, . . . 130-N. The user device 104 is also able to communicate with the network 130 via connection 135.

25 In operation, the user device 104 communicates with the vendor location system 102 via the antennas 118 and 122 and the wireless transceivers 110 and 126 to request vendor information comprising a vendor identifier, and possibly additional vendor information, for use in electronic bookmarking of the vendor location. This process will be described in greater detail below in conjunction with the flow diagram of FIG. 2.

The user device 104 may also provide a device identifier or other type of user device information to the vendor location system 102. Such a device identifier may be used 30 by the vendor, e.g., to create customer lists for direct "push" updating of vendor information, as will be described in greater detail below. The above-noted other types of user device information, which may be transmitted only with prior user approval, may include contact information such as user name, post office address, telephone number, e-mail address, etc.

The elements of the vendor location system 102 may represent elements of one or more conventional devices, such as a personal computer, workstation, computer system, etc. It should be noted that the system 102 may include other elements not shown, or other types and arrangements of elements capable of providing the electronic bookmarking functions described herein. For example, a simplified embodiment of the invention may 5 include a vendor location system which repeatedly broadcasts a corresponding vendor identifier via radio frequency (RF) transmission or another suitable mechanism, and does not necessarily provide other processing functions.

The wireless transceiver 110 and user device 104 may each be configured in a 10 conventional manner to operate in accordance with a wireless communication standard such as wireless access protocol (WAP) or Bluetooth. The invention can also be configured to utilize wireless serial communications, such as that provided by a wireless modem. An example of such a wireless modem is the Radio Modem from 3JTech, 15 <http://www.a3j.com.tw/chinese/radiomodem.html>. Other types of communication standards or techniques could also be used to support communication between the vendor location system 102 and the user device 104, such as infrared protocols, pager technology, etc.

The CPU 112 and memory 114 of the vendor location system may be 20 configured in a conventional manner, e.g., as elements of a personal computer or computer system installed at the physical vendor location. The CPU 112 may be an element of a microprocessor in such a computer or computer system. The memory 114 may represent an electronic memory, an optical or magnetic disk-based memory, or a tape-based memory, as well as portions or combinations of these and other types of memories. For example, in one possible implementation of the vendor location system 102, a simple tape may be played 25 repeatedly through a wireless connection via the antenna 118 so as to broadcast a vendor identifier to multiple user devices simultaneously.

The user device 104 may be implemented as a personal digital assistant (PDA) such as a Palm Pilot™ or Handspring Visor™, a wireless telephone, a portable computer, a 30 Philips Pronto™ device, or any other type of portable device capable of communicating with the vendor location 102 in conjunction with the performance of an electronic bookmarking function. The transceiver 126, CPU 128, and memory 129 of the user device 104 may be configured in a conventional manner. If required by the particular wireless communication used in a given embodiment, the user device 104 is equipped with an antenna, such as antenna 122 shown in FIG. 1. However, the use of such an antenna is not a requirement of the present invention.

Although only a single user device 104 is shown in FIG. 1, it should be understood that the vendor location system 102 may be configured to communicate with multiple user devices, of a variety of different types. For example, as previously noted, the system 102 may communicate with multiple user devices simultaneously, or in a time-multiplexed manner, using well-known conventional techniques.

The electronic bookmarking techniques described herein may be implemented in whole or in part using software stored in the vendor location system 102 and in the user device 104. For example, the electronic bookmarking functions performed by the vendor location system 102 may be performed under the control of one or more software programs stored in memory 114 and executed by CPU 112. Similarly, the electronic bookmarking functions performed by the user device 104 may be performed under the control of one or more software programs stored in memory 129 and executed by CPU 128. The particular manner in which such software programs may be stored and executed in processing elements such as system 102 and device 104 is well understood in the art and therefore not described in detail herein.

FIG. 2 is a flow diagram illustrating an electronic bookmarking process in accordance with the invention. The process may be implemented in the system 100 of FIG. 1, or in another appropriately-configured system. It will be assumed for the description of the FIG. 2 flow diagram that the user device 104 is a PDA, although as previously noted the invention is more generally applicable to a wide variety of other user devices.

In step 200 of FIG. 2, the user visits a physical vendor location, such as a store, restaurant or theater. If the user likes the particular vendor, and therefore wants to bookmark the vendor location, the user in step 202 enters a designated command via the PDA 104. For example, one of the keys 124 on the PDA 104 may be a "bookmark" key or button which the user presses to enter the designated bookmark command. As another example, the command may be activated using a point and click interface which operates in conjunction with a "bookmark" icon presented on the display 120 of the PDA 104. The keys 124 may be implemented in whole or in part as buttons or icons on a touch-sensitive screen, as is possible on many existing PDAs and the above-noted Pronto™ device. It is desirable but not required that the bookmark command be activated using only a single key stroke, or at most a few key strokes, so as to facilitate rapid bookmarking of multiple vendor locations with minimal user effort.

Upon entry of the designated bookmark command, the PDA 104 in step 204 communicates with the wireless transceiver 110 of the vendor location system 102 in order to

request information regarding the corresponding vendor. This information generally includes a vendor identifier, which may be in a numeric or alphanumeric format and uniquely identifies the particular vendor, and may include additional vendor information such as vendor name, vendor location specified in terms of address, latitude and longitude, or other format, telephone number, e-mail address, web site, hours of operation, specials, features, etc. The vendor location information, if specified in terms of latitude and longitude or similar format, can be utilized by a personal or in-car navigation system to facilitate subsequent location of the physical vendor site.

The vendor identifier and possibly the additional vendor information are transmitted by the wireless transceiver 110 of the vendor location system 102 in step 206. The PDA 104 in step 208 receives and stores the vendor information transmitted in step 206 by the vendor location system. As one possible alternative, the vendor location system 102 may continuously broadcast the vendor identifier. Such an arrangement limits the cost and complexity associated with the vendor system and the PDA. For example, this arrangement allows the vendor location system 102 to be implemented in an inexpensive manner using only a pre-recorded message and a transmitter.

After the vendor identifier for a given vendor location has been received and stored by the PDA 104 in the manner described previously, the PDA 104 in step 210 may utilize the stored vendor identifier to retrieve updated vendor information periodically from the network 130 via connection 135 as illustrated in FIG. 1. The updated information may include the latest advertisements, sale items, movie listings, announcements, coupons, specials, features, etc. associated with the particular bookmarked vendor.

The updating of the information to be retrieved by the PDA 104 may be the responsibility of the particular vendor. For example, the vendor location system 102 may be configured to communicate periodically over network 130 to one or more of the servers 132 to provide the updated vendor information for storage thereon. The PDA 104 can then access the updated information via connection 135 with network 130. The connection 135 may be a conventional network connection, such as a connection implemented in accordance with well-known TCP/IP (transmission control protocol/Internet protocol) techniques.

The PDA 104 makes the retrieved information available to the user using any of a number of different techniques, such as presentation of at least a portion of the information or a corresponding alarm icon or other indicator on the display 120, or by storage of the information in a designated file for subsequent access by the user.

For example, in one possible implementation of the illustrative embodiment, only the vendor identifier is transmitted by the vendor location system and stored in the PDA 104. The PDA then subsequently accesses a web site over network 130 using the vendor identifier, automatically retrieves the most recent relevant vendor information from the site, 5 and makes that information available to the user in a desired manner. As another example, the vendor identifier as well as additional information is transmitted by the vendor location system 102 and stored directly into the PDA 104 via a wireless network such as a paging network. The PDA 104 may use the stored information to access periodically updated 10 information via the network 130, so as to ensure that the information for the particular vendor previously bookmarked by the user always remains up to date. In order to improve the efficiency of the update process, the vendor may time-stamp or otherwise denote the version 15 of the transmitted vendor information, so as to thereby allow the PDA 104 to eliminate unnecessary re-loading of already current vendor information.

The update process may be configured such that the PDA 104 is required to 15 provide explicit permission before the vendor location system or an associated network-based service can "push" updated vendor information to the device automatically. This permission may be in the form of an address, password, authorization or other type of information transmitted from the PDA 104 to the vendor location system 102 or the associated network-based service. In this manner, updated vendor information can be delivered to the PDA 104 20 as the information is updated, rather than through device-driven techniques only. The updated vendor information in this case may be delivered, e.g., via broadcast to all user devices or a designated subset of user devices, separately to each particular user device based on the bookmarks established by that device, or via any other suitable technique.

Advantageously, the above-described electronic bookmarking technique 25 allows a PDA or other user device to store vendor information and periodically update that information in a particularly efficient manner.

The invention may also be implemented so as to provide a return channel from the user device 104 to the vendor location system 102 for communication of user identifying information such as name, e-mail address, preferences, suggestions, etc. Such information 30 may be transmitted by the user device 104 upon receipt of the vendor identifier in step 208 of FIG. 2, or as part of the request for vendor information transmitted by the user device 104 in step 204. Other arrangements could also be used to transmit user information from the user device 104 to the vendor location system 102. For example, the user may enter such

information at a vendor web site supported by one or more of the servers 132 and accessible over the network 130.

The updating process described above may be implemented in the form of a continuously-changing, real-time "yellow pages" system in which information is made available to the user device 104 over the network 130 or in a high-bandwidth local data channel in a manner which allows the relevant updated vendor information to be extracted by the user device 104. For example, associated with each portion of the information made available to the user device 104 may be updated information for a large number of vendors. The provided information may include common information for each of the vendors, such as the vendor location address within a mall. The user device 104 then uses the stored vendor identifiers for those vendors that the user has bookmarked to identify the appropriate portions of the information to be downloaded into the user device 104. In such an implementation, the user device 104 uses the stored vendor identifiers as a filter to filter out the desired updated vendor information from that of other non-bookmarked vendors.

The real-time "yellow pages" system described above may also be configured so as to allow a user to make an initial selection of a vendor location of interest, for electronic bookmarking purposes, without the user actually visiting the physical vendor location. After the vendor location has been bookmarked, the updated vendor information can be provided to the user device in the manner previously described.

One of the above-noted vendor identifiers can be sold by a service provider to each vendor on a subscription basis, in a manner similar to a yellow pages entry. The vendor can use the vendor identifier to change its vendor information, e.g., via communication with a web site over the network 130 in the manner previously described, by a private network connection, by direct communication with a telephone operator, etc. The vendors may also be charged a service fee by the service provider for each time their information is updated, or the service fees may be charged on a subscription basis.

The delivery of updated vendor information based on electronic bookmarking in accordance with the present invention provides focused information which is particularly valuable to the users that have bookmarked the corresponding vendors.

Although in the illustrative embodiment described above the vendor identifier is initially transmitted over a wireless connection to a user device in proximity to the physical vendor location, this is not a requirement of the invention. In other embodiments, the vendor identifier could be supplied in another manner, such as via a web site, and once bookmarked by the user can be utilized by the user device to retrieve automatically and periodically the

latest updated vendor information. Such an embodiment could be used to permit vendors at physical locations remote from the user device to be electronically bookmarked. For example, a user could obtain and bookmark a vendor identifier for a vendor such as Disneyland, and the updated information periodically retrieved by the user device could 5 include vacation specials, ticket discounts, etc.

As previously noted, the invention may be implemented at least in part in the form of one or more software programs that are configured to perform the electronic bookmarking functions described herein.

The above-described embodiments of the invention are intended to be 10 illustrative only. For example, the invention can be used in other types of information processing systems using other arrangements of system processing elements. The particular manner in which a vendor identifier is obtained and stored by a user device, and the manner in which the identifier is utilized by the user device to retrieve or otherwise obtain periodically updated vendor information, may vary in accordance with the requirements of a 15 particular implementation. These and numerous other embodiments within the scope of the following claims will be apparent to those skilled in the art.

CLAIMS:

1. A method for processing information relating to a vendor location, the method comprising the steps of:

storing in a user device (104) a vendor identifier associated with a particular physical vendor location designated as being of interest by a user of the user device; and
5 utilizing the vendor identifier to obtain periodically via the user device updated vendor information for the vendor location, such that the updated information is made available to the user via the user device.

2. The method of claim 1 wherein the vendor identifier is received by the user 10 device via a wireless communication link (125) with a system (102) at the vendor location.

3. The method of claim 2 wherein the vendor identifier is transmitted by the vendor location system in response to a request received over the wireless communication link from the user device.

15 4. The method of claim 2 wherein additional vendor information is received by the user device via the wireless communication link in conjunction with receipt of the user identifier, the additional information including at least one of a vendor name, a vendor location, a vendor telephone number, a vendor e-mail address, a vendor web site, an 20 indication regarding hours of operation, a special, and a feature.

5. The method of claim 1 wherein the vendor identifier is obtained by the user device in response to entry by the user of a designated bookmark command at the user device.

25 6. The method of claim 1 wherein the vendor identifier is entered by a user into the user device.

7. The method of claim 1 wherein the updated vendor information is entered by the vendor via a connection established with a network (130).

8. The method of claim 1 wherein the updated vendor information is retrieved by 5 the user device via a connection established with a network (130).

9. The method of claim 1 wherein the user device utilizes the stored vendor identifier in a filtering operation to filter from a set of available vendor information the particular updated vendor information for the vendor location designated as of interest by the 10 user.

10. The method of claim 1 wherein the vendor location comprises at least one of a store, a restaurant and a theater.

15 11. The method of claim 1 wherein the updated vendor information comprises at least one of an advertisement, a sale item, a product listing, an announcement, a coupon, a special and a feature.

20 12. The method of claim 1 wherein at least a portion of the updated vendor information is communicated to a navigation system at least in part via the user device.

13. An apparatus for use in processing information relating to a vendor location, the apparatus comprising:
25 a user device (104) operative to store a vendor identifier associated with a particular physical vendor location designated as being of interest by a user of the user device, wherein the vendor identifier is utilized to obtain periodically via the user device updated vendor information for the vendor location, such that the updated information is made available to the user via the user device.

30 14. An apparatus for use in processing information relating to a vendor location, the apparatus comprising:
a vendor location system (102) operative to transmit to a user device (104) a vendor identifier associated with a particular physical vendor location designated as being of interest by a user of the user device, wherein the vendor identifier is subsequently utilized to

obtain periodically via the user device updated vendor information for the vendor location, such that the updated information is made available to the user via the user device.

15. An article of manufacture comprising a machine-readable storage medium
5 containing one or more software programs for processing information relating to a vendor
location, wherein the one or more software programs when executed implement the steps of:
storing in a user device (104) a vendor identifier associated with a particular
physical vendor location designated as being of interest by a user of the user device; and
utilizing the vendor identifier to obtain periodically via the user device
10 updated vendor information for the vendor location, such that the updated information is
made available to the user via the user device.

16. A method for processing information relating to one or more vendor locations, the method comprising the steps of:

17. The method of claim 16 wherein the updated vendor information for the plurality of vendor locations is transmitted to each the plurality of user devices and filtered within a given one of the devices to obtain particular updated vendor information designated as being of interest to the user of the given device.

18. The method of claim 16 wherein at least a portion of the updated vendor
30 information is broadcast simultaneously to each of at least a subset of the plurality of user
devices.

19. The method of claim 16 wherein the updated vendor information designated for receipt by a given one of the user devices is transmitted separately to that user device.

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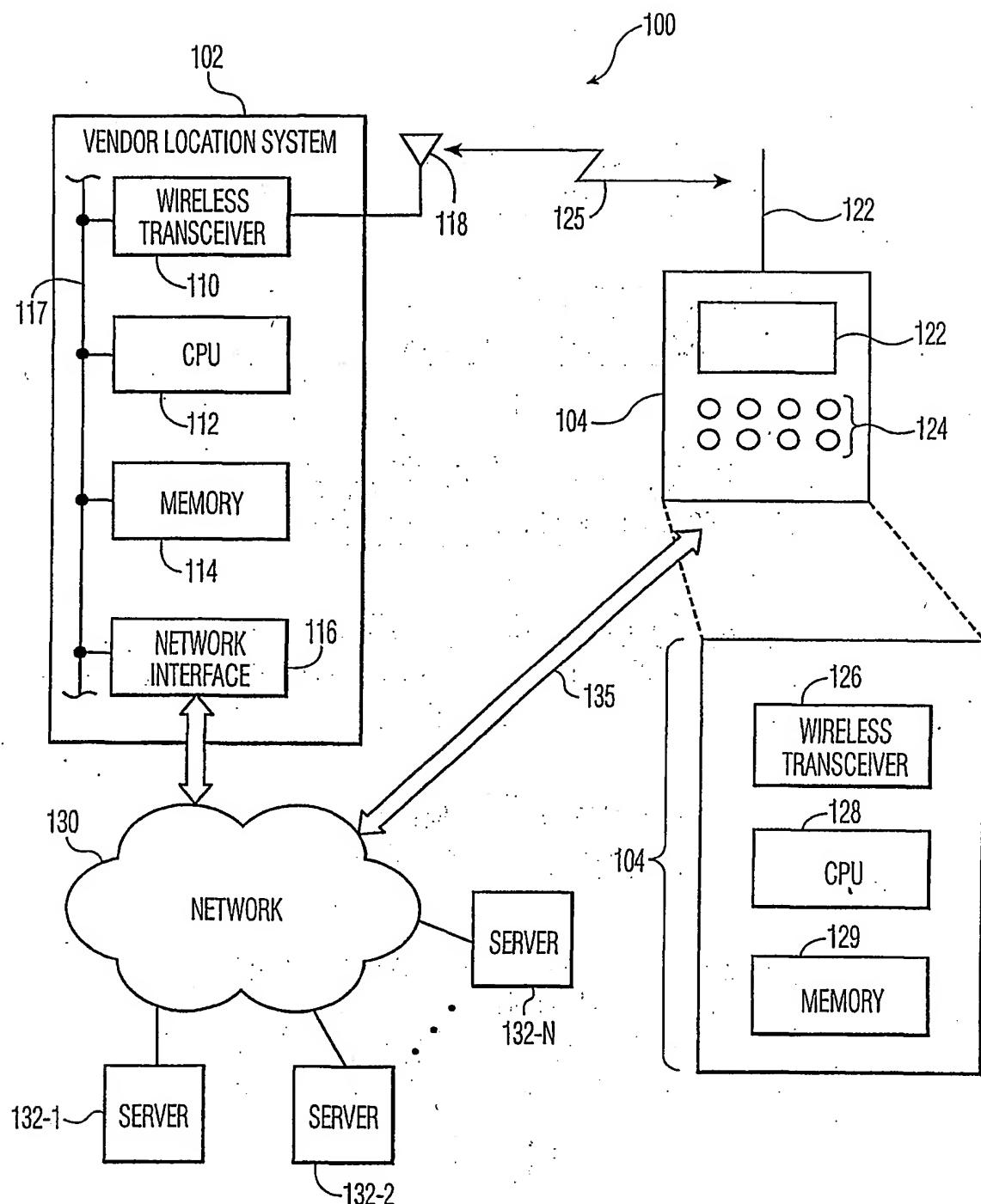


FIG. 1

2/2

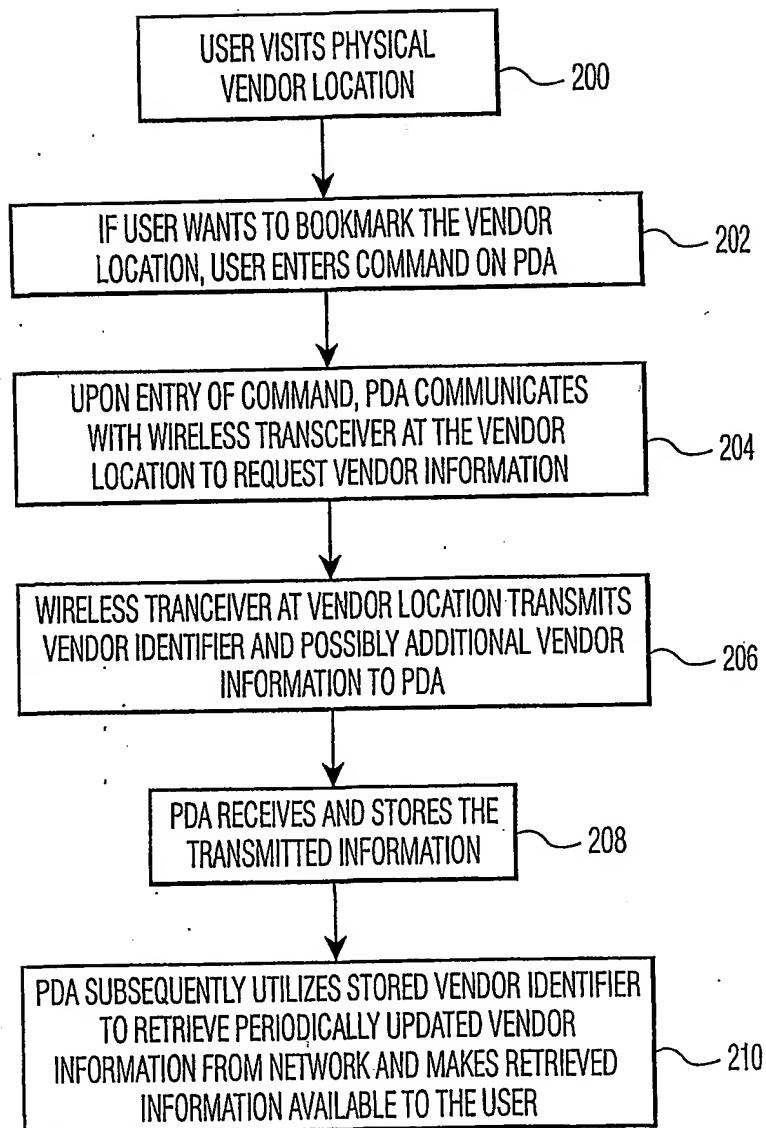


FIG. 2